IN THE DRAWINGS:

Submitted herewith is a replacement sheet for Fig. 5 incorporating revisions to label the equatorial centerplane EP and the line L crossing the equatorial centerplane described on pages 7-8 the specification.

REMARKS

In the last Office Action, the Examiner objected to claim 1 as containing an informality. Claim 1 was rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Patent No. JP 8-156502 ("Japan '502") in view of applicants' prior art disclosure in Figs. 11A, 11B ("APD") or Japanese Patent No. JP 58-152605 ("Japan '605"). Additional art was cited of interest.

In accordance with the present response, the specification has been suitably revised to correct minor informalities and to bring it into better conformance with U.S. practice. Original independent claim 1 has been amended to clarify the structure and position of the first and second lugs formed in the tire tread of the agricultural wheel tire. Claim 1 has been further amended to correct informalities and instances of indefiniteness, in formal respects to improve the wording, and to bring it into better conformance with U.S. practice. New claims 2-12 have been added to provide a fuller scope of coverage. A new abstract which more clearly reflects the invention to which the amended and new claims are directed has been substituted for the original abstract. Submitted herewith is a replacement sheet for Fig. 5 incorporating revisions to label the equatorial centerplane EP and the line L crossing the equatorial centerplane described pages 7-8 the specification.

Applicants request reconsideration of their application in light of the following discussion.

Brief Summary of the Invention

The present invention relates to an agricultural wheel tire.

The specification (pgs. 1-3) describes a conventional wheel tire for an agricultural working machine. As described in the specification, a problem with the conventional wheel tire is that its construction does not prevent it from sinking too much into the ground during a working operation. As a result, a lower portion of the working machine contacts the ground and prevents smooth traveling of the working machine along the ground during a working operation. This makes it particularly difficult to use the conventional agricultural wheel tire on soft or cultivated land with high traveling performance.

The present invention overcomes the drawbacks of the conventional art. Figs. 4-7 show an embodiment of an agricultural wheel tire 102 according to the present invention embodied in the claims. The agricultural wheel tire 102 has a tire tread 103 having first and second lateral edges 107, 108 defining the width of the tread 103. First lugs 104 extend from an approximate center of the tread width and terminate at

the first lateral edge 107 of the tire tread 103. Second lugs 105 extend from the approximate center of the tread width and terminate at the second lateral edge 108 of the tire tread 103. The first and second lugs 104, 105 extend in an alternating manner in a circumferential direction of the tire tread 103 so that side surfaces 104a, 104b of adjacent first lugs 104, an end surface 105a of one of the second lugs 105 disposed between the adjacent first lugs, and a surface 116 of the tire tread 103 disposed between the adjacent first lugs 104 form a first generally spherical-shaped depressed portion 121, and so that side surfaces 105a, 105b of adjacent second lugs 105, an end surface 104c of one of the first lugs 104 disposed between the adjacent second lugs 105, and a surface 114 of the tire tread 103 disposed between the adjacent second lugs 105 form a second generally spherical-shaped depressed portion 118.

By the foregoing construction, during travel of agricultural wheel tire according to the present invention on a cultivated field or soft soil, the wheel tire gathers and hardens the soil with the spherical-shaped depressed portions to thereby transmit a sufficient driving force of the wheel tire to the cultivated field or soil and avoid the sinking of the wheel tire into the soil. An undersurface of the working machine using the agricultural wheel tire of the present

invention is thus prevented from contacting the cultivated field or soft soil, thereby improving the travel performance of the working machine.

Traversal of Prior Art Rejection

Claim 1 was rejected under 35 U.S.C. §103(a) as being unpatentable over Japan '502 in view of APD or Japan '605. Applicants respectfully traverse this rejection and submit that the combined teachings of Japan '502, APD and Japan '605 do not disclose or suggest the subject matter recited in amended independent claim 1.

Amended independent claim 1 is directed to an agricultural wheel tire and requires a tire tread having first and second lateral edges defining the width of the tread, the tire tread having a plurality of first lugs extending from an approximate center of the tread width and terminating at the first lateral edge of the tire tread, and a plurality of second lugs extending from the approximate center of the tread width and terminating at the second lateral edge of the tire tread. Amended claim 1 further requires that the first and second lugs extend in an alternating manner in a circumferential direction of the tire tread so that side surfaces of adjacent first lugs, an end surface of one of the second lugs disposed between the adjacent first lugs, and a

surface of the tire tread disposed between the adjacent first lugs form a first generally spherical-shaped depressed portion, and so that side surfaces of adjacent second lugs, an end surface of one of the first lugs disposed between the adjacent second lugs, and a surface of the tire tread disposed between the adjacent second lugs form a second generally spherical-shaped depressed portion. No corresponding structural combination is disclosed or suggested by the prior art of record.

Japan '502 discloses an agricultural wheel tire 10 comprising a tire tread 26 having alternating lugs 34 separated by notches 37, the surfaces of which form depressions having a concave shape in a circumferential direction (Figs. 4-5). While acknowledging that the depressions in Japan '502 are <u>not</u> spherical-shaped (i.e., the concave shape does not also extend in the axial direction of the tire tread), the Examiner cited Japan '605 and APD for their disclosure of a tire tread with lugs forming depressions which are concave in an axial direction. The Examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the concave depressions in Japan '502 so that they extend in the axial direction, as disclosed by Japan '605 or APD, in addition to the circumferential direction, in order to

"provide the depression with a substantially spherical shape." Applicants respectfully traverse the Examiner's contention and the application of the prior art references to reject independent claim 1.

Applicants respectfully submit that the Examiner has failed to establish a prima facie case of obviousness with respect to the rejection of independent claim 1 based on the combined teachings of Japan '502, APD and Japan '605. The proposed combination of Japan '502, APD and Japan '605 relied upon by the Examiner to reject the claim does not meet the basic criteria for establishing a prima facie case of obviousness within the meaning of 35 U.S.C §103 which requires some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. See, e.g., Symbol Technologies, Inc. v. Opticon, Inc., 935 F.2d 982, 989, 18 USPQ2d 1885 (Fed. Cir. 1991).

The Examiner's motivation or suggestion for combining Japan '502 with APD or Japan '605 is that APD and '605 teach some benefit in shaping depressions in a tire tread so that they are concave in an axial direction. However, in the Examiner's modification of Japan '502 in view of APD or Japan '605, the Examiner must specifically point out any

suggestion or motivation for further shaping the depressions (i.e., which are concave in only a circumferential direction) in Japan '502 in the axial direction in order to achieve depressions which are generally spherical-shaped. The Examiner's contention that APD and Japan '605 teach some benefit in shaping depressions in a tire tread so that they are concave in an axial direction is irrelevant and does not address the question of whether one of ordinary skill in the art would have found it obvious at the time the invention was made to form the depressions in the tire tread of Japan '502 so that they are generally spherical-shaped.

Nevertheless, applicants respectfully submit that, contrary to the Examiner's contention, one of ordinary skill in the art would not have found it obvious at the time the invention was made to modify Japan '502 in view of APD or Japan '605 as proposed by the Examiner because the proposed modification would not lead to the claimed invention. In this regard, each of APD and Japan '605 teaches a tire tread having depressions which are concave only in an axial direction (i.e., the depressions in the tire treads of APD and Japan '605 are not generally spherical-shaped). Thus, modification of the tire tread of Japan '502 in view of APD or Japan '605 as proposed by the Examiner would lead to a tire tread having depressions which are concave in only an axial direction,

which is not the claimed invention recited in amended independent claim 1 which requires a tire tread having generally spherical-shaped depressions (i.e., depressions which are concave in axial and circumferential directions).

Furthermore, the Examiner's approach in applying the prior art references under 35 U.S.C. §103 has failed to properly consider the invention as a whole recited in amended independent claim 1, which requires that the spherical-shaped depressions are formed by specific surfaces of adjacent first and second lugs of the tire tread. No corresponding structure for the spherical-shaped depressions is disclosed or suggested by the prior art of record.

Thus amended independent claim 1 is not rendered obvious by the references to Japan '502, APD and/or Japan '605 because the references do not suggest the modifications that would be needed to replicate the claimed invention. In the context of obviousness rejections based upon the purported obviousness of effecting a required modification, the Federal Circuit has held that "[t]he mere fact that the prior art may be modified in [a given] manner ... does not make the modification obvious unless the prior art suggested the desirability of the modification". In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). There is nothing in APD or Japan '605 that would have suggested modifying the structure of

Japan '502's wheel tire to achieve the structural combination of the wheel tire discussed above and recited by amended independent claim 1.

In view of the foregoing, applicants respectfully request that the rejection of claim 1 under 35 U.S.C. §103(a) as being unpatentable over Japan '502 in view of APD or Japan '605 be withdrawn.

Applicants respectfully submit that the prior art of record also does not disclose or suggest the subject matter recited in newly added claims 2-12.

New claims 2-8 depend on and contain all of the limitations of amended independent claim 1. New claims 2-3 are directed to the overlapping relationship between the first and second lugs in the circumferential direction of the tire tread. Claims 4 and 7 are directed to the symmetrical feature of the depressed portions. Claims 5-6 are directed to the positional relationship between surfaces of adjacent first and second lugs. Claim 8 recites that an outer tread surface of each of the first and second lugs for contacting the ground surface is generally planar. The features recited in claims 2-8, in combination with the structural features recited in amended independent claim 1, are not disclosed or suggested by the prior art of record.

New independent claim 9 defines the invention in a different manner and provides a different scope of coverage from amended independent claim 1. For example, claim 9 recites the specific function of the spherical-shaped depressed portions, which harden the soft soil during use of the wheel tire to prevent the wheel tire from sinking into the soft soil. No corresponding function is disclosed or suggested by the prior art of record.

New claim 10-12 depend on new independent claim 9. New claim 10 recites the specific surfaces of the first and second lugs and the tire tread which define the spherical-shaped depressed portions. New claims 11-12 are directed to the overlapping feature of the first and second lugs (claim 11) and the symmetrical relationship between the depressed portions (claim 12). No corresponding structure is disclosed or suggested by the prior art of record.

In view of the foregoing amendments and discussion, the application is believed to be in allowable form. Accordingly, favorable reconsideration and allowance of the claims are most respectfully requested.

Respectfully submitted,

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DECEMBER 13, 2005
Date